

## 4. MARINE FINGERLING PRODUCTION AT THE BRIBIE ISLAND AQUACULTURE RESEARCH CENTRE INTENSIVE GREEN-WATER CULTURE: AN HISTORICAL PERSPECTIVE

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### INTRODUCTION

For the past 10 years, the Bribie Island Aquaculture Research Centre (BIARC) has been at the forefront of sub-tropical marine fingerling production for aquaculture research and restocking programs. Initially, the need for an intensive green-water culture (GWC) system was driven by the universal dissatisfaction with clear-water rotifer production. The clear-water system was too labour intensive, produced a lack of size ranges of prey items, unreliable rotifer production and daily disturbance of larval rearing tanks. The pond GWC method proved successful yet unreliable, particularly during monsoonal rains in Northern Queensland. The layer of fresh water on the top of the pond prevented swim bladder inflation by fish larvae at certain critical times. Out of necessity, the intensive GWC system emerged to service the need for a reliable larval rearing method that produced large numbers and excellent survival of fingerlings. Initially the system was developed for barramundi (*Lates calcarifer*) and was published in a QDPI Information Series *Development of a low-maintenance technique for rearing barramundi larvae*.

At the same time, the local hatchery industry was attempting to spawn and rear Australian Bass (*Macquaria novaemaculata*). Southern Queensland had recognised potential for aquaculture of this species because it is the northern end of the geographic distribution. Experience in NSW again highlighted the unreliability of clear-water rotifer systems, and the ensuing interaction of local industry with QDPI and the subsequent adoption of the GWC system kick-started the most successful stocking of Australian Bass in southern Queensland.

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<sup>1</sup> QDPI Bribie Island Aquaculture Research Centre. (See details in appendix.)

In 1993, a Queensland State Government Inquiry into recreational fishing recommended that a pilot program to test the efficacy of an estuarine fish stocking program in south-east Queensland be undertaken. At the time, the program was the largest marine stocking exercise ever undertaken in Australia. Nearly two million sand whiting (*Sillago ciliata*) and 3/4 million dusky flathead (*Platycephalus fuscus*) fingerlings were produced through intensive GWC systems at BIARC. Again, the generic GWC was the enabling technology system that allowed the production of large numbers of fingerlings (Table 1) and a successful stocking program.

Since that time, BIARC has been involved in 'Mass Propagation of Snapper', a CRC-funded project with the NSW Fisheries (PI: Dr Geoff Allen and Mr Stuart Fielder). This also proved the success and adaptability of the GWC system (Table 1).

With the appointment at BIARC of Dr Abigail Elizur from the National Centre for Mariculture, Israel, the capacity to further extend the research and species list adaptable to this GWC technology has been greatly enhanced. Dr Elizur has 22 years research experience, 10 years in aquaculture research. She has devoted much of her time to the hormonal manipulation of gonadal development in finfish (puberty and spawning) and molecular studies on key reproductive hormones with emphasis on GNRH's (and receptors) and gonadotrophins.

With this experience, BIARC has also been able to produce 25 000 grey mullet (*Mugil cephalus*) fingerlings, a first for Australia. Together with the successful production of 80 000 rabbit fish (*Siganus fuscescens*) fingerlings, it will provide BIARC the capacity to further research the potential for biological remediation of eutrophic systems using finfish.

**Table 4.1.** Controlled green-water culture of finfish larvae.

Common name	Scientific name	Average survival%	Number produced (thousands)
Australian bass	<i>Macquaria novaemaculata</i>	80	250
Barramundi	<i>Lates calcarifer</i>	87	1,500
Summer whiting	<i>Sillago ciliata</i>	95	1,950
Dusky flathead	<i>Platycephalus fuscus</i>	95	750
Snapper	<i>Pagrus auratus</i>	60	194
Sea mullet	<i>Mugil cephalus</i>	20 <sup>2</sup>	25

<sup>2</sup> As good as, if not better than survival rates elsewhere in the world, and a first for Australia.